

**MEMORANDUM OF AGREEMENT BETWEEN  
THE TENNESSEE DIVISION OF UNDERGROUND STORAGE TANKS  
AND**

\_\_\_\_\_  
(SIR Vendor Company Name)

**All SIR methods and SIR vendors must be approved by the Division before the respective SIR can be used as a release detection method. All SIR vendors must agree to abide by the Division's policy concerning the use of SIR as a method of monthly monitoring in Tennessee. The Division requires that a copy of this agreement be given to the owner/operator and shall be maintained as long as services are provided by the SIR vendor.**

I, \_\_\_\_\_ am an official in the position of \_\_\_\_\_ in the above named Company (the Company) and am duly authorized to enter into Agreements on behalf of the Company. My signature affixed to this document indicates the following:

1. That the Company agrees to and will adhere to conditions as stated herein in the use of Statistical Inventory Reconciliation (SIR), also known as Statistical Inventory Analysis (SIA) as a petroleum underground tank leak detection method, and,
2. The Company's participation in this agreement is voluntary.

**I. SIR VENDOR REQUIREMENTS:**

- A. The Company must obtain qualitative or quantitative third-party evaluation for its method utilizing established EPA protocols for SIR and must provide copies of it's evaluation to its clients using SIR in Tennessee. The Company must be listed in the List produced by the National Work Group on Leak Detection Evaluations. SIR result reporting to clients in Tennessee will be either quantitative or qualitative, consistent with the type of method.
- B. Inventory data must be analyzed at least every 30 days to determine if the UST system is tight. When the owner/operator receives monthly test results from the SIR vendor, it is the owner/operator's responsibility to report all suspected releases to the Division within 72 hours of becoming aware of a suspected release. The Company must provide a monthly SIR result to the owner/operator within 10 business days after the end of the 30-day period.
- C. Results of each SIR analysis must be determined with a probability of detection of at least 95% and a probability of false alarm of no more than 5% and reported as either (1) Pass, (2) Fail, or (3) Inconclusive. These categories are summarized below:
  1. **PASS:** Means that the calculated leak rate **does not exceed** the predetermined value of 0.10 gallons per hour (gph) **and** the minimum detectable leak in the monthly data does not exceed 0.20 gallons per hour (gph). The number of valid daily readings must equal the number required for a valid result as certified in the Third Party evaluation for the method.
  2. **FAIL:** Means that the calculated leak rate **exceeds** the predetermined value of 0.10 gph **and** the minimum detectable leak in the monthly data does not exceed 0.20 gallons per hour (gph). Any time the owner/operator receives notice of a "Fail" that fact **must** be reported to the Division within within seventy-two (72) hours. Immediately upon receiving SIR "Fail" results or two (2) consecutive inconclusives, the following steps must be taken within a thirty (30) day time period:

- a. Conduct an UST systems tightness test; If the test result is a “pass” and there is no environmental contamination present, no further action is required; or
  - b. Conduct an UST systems tightness test; If the test result is a “pass” and environmental contamination is present, a site check must also be performed; or
  - c. Conduct an UST systems tightness test; If the test result is a “fail”, a site check must also be performed.
3. **INCONCLUSIVE**: An inconclusive generally indicates that the inventory records are too poor, have too much variability, or are of insufficient length such that the data could not be analyzed with reliable results. The following results may be considered inconclusive:
- a. A month in which the minimum detectable leak in the data exceeds 0.20 gallons per hour (gph).
  - b. A month in which the calculated leak rate **exceeds** the predetermined value of 0.10 gallons per hour (gph) **and** the minimum detectable leak in the monthly data exceeds 0.20 (gph).
  - c. A month in which the number of valid daily readings does not equal the number required for a valid monthly result as certified in the Third Party evaluation for the method.
  - d. A month in which the SIR result is a “gain” or indicates a “gaining trend” that exceeds the predetermined value of 0.10 gph, and this result **is not due to measurable water incursion**, then this result may be considered an ‘inconclusive’ and treated as such. If the gain **is due to measurable water incursion**, then it must be reported as a ‘fail’ and the appropriate procedures followed.
- D. If a **qualitative SIR** method is used, the vendor must first determine if the monthly data will pass the data quality criterion, which is the performance standard for monthly monitoring methods, 0.2 gallons per hour (gph). If the monthly data does not meet this criterion, the result is ‘Inconclusive’. If the data passes the quality test, then the data can be examined for evidence of a release. This is the comparison of the data with a linear graph that is equivalent to one half of the performance standard for the method, or 0.1 gallons per hour (gph). If the linear graph of the monthly data is less than this line the result is a ‘Pass’; if it exceeds this line it is a ‘Fail’.
- E. If a monthly report indicates an Inconclusive result, the owner/operator shall immediately implement the SIR vendor’s procedure for investigating and determining the cause of the inconclusive. If the reason for the inconclusive is a physical problem, such as meter miscalibration, the problem must be immediately corrected. The dataset may not be reanalyzed a second time. If the next **consecutive** month’s results are also inconclusive, the tank owner must report this to the Division within 72 hours as a suspected release, and conduct a tightness test on the UST system within 30 days.
- F. SIR vendors must base monthly results on data analysis of daily inventory measurements and collected data. SIR vendors may not make monthly calls using the inventory control standard of 1% of monthly throughput plus 130 gallons. For instance, if a valid monthly SIR analysis indicates that the predetermined value of 0.10 gph is exceeded, the result must be a ‘fail’, regardless of whether or not the inventory control standard of 1% of monthly throughput plus 130 gallons is exceeded. Tank owners may **not** rely on inventory control results while using SIR as their release detection method.
- G. SIR System Failures (or for 2 consecutive monthly SIR inconclusive results)
1. Should SIR indicate a failure for any single month, the tank owner must report a **suspected release** to the Division within 72 hours of receiving this information. 1200-115-.05(1).
  2. The owner must begin a release investigation immediately upon learning of a SIR failure result and may use the SIR vendor’s loss investigation procedure as a part of the release investigation. If factors

accounting for the unexplained loss are identified they must be immediately corrected. Within 30 days a system test (tightness test) must be done. 1200-1-15-.05(3). Any methodology described in 1200-1-15-.04(3) and (4) which has been third-party certified according to EPA established protocols to detect leaks of 0.1 gph with at least a 95% probability of detection and no more than 5% probability of false alarm may be used to comply with this system test requirement, except SIR.

3. If the system passes and there is no known environmental impact, a site check is not required.

H. The monthly SIR report must contain at a minimum the following information: location name and Tennessee UST Facility number; complete address of location; tank owner's name and phone number; name of SIR method and version used; name and address of SIR provider; and month being analyzed. For each individual tank the following information must be provided: tank number, size, and product; the minimum detectable leak rate and calculated leak rate for the data set (for quantitative methods); the number of days analyzed; a result that is either 'Pass', 'Fail', or 'Inconclusive' based on the criteria in I.C or D. The raw monthly data (product level measurements, volume conversions, reconciliation to book values, etc.) must be attached to or incorporated into the monthly SIR report.

## **II. TANK OWNER REQUIREMENTS:**

Tank owners using SIR must meet the following:

A. All requirements pertaining to inventory control in Rule 1200-1-15-.04(3)(a) 1-6 as follows:

1. Inventory volume measurements for petroleum inputs, withdrawals, and the amount still remaining in the tank are recorded each operating day. (An "operating day" is considered to be any day product is placed into or removed from the tank. All readings required for daily SIR data collection must be done each operating day.)
2. The equipment used to take daily inventory readings is in good state of repair and is capable of measuring the level of petroleum over the full range of the tank's height to the nearest one-eighth of an inch;
3. The petroleum inputs are reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery;
4. Deliveries are made through a drop tube that extends to within one foot of the tank bottom; (tank level measurements do not have to be made through the drop tube)
5. Petroleum dispensing is metered and recorded within the local standards for meter calibration or an accuracy of 6 cubic inches for every 5 gallons of petroleum withdrawn;
6. The measurement of any water level in the bottom of the tank is made to the nearest one-eighth of an inch at least once a month, recorded, and taken into consideration in the SIR determination of tank status.

B. UST systems must have tank charts that have been calibrated from empty to full in 1/8 inch increments.

C. Some SIR vendors make versions of their SIR program available as packaged software that may be operated by the tank owner on a personal computer. Such systems may be referred to as "stand alone" SIR systems. These systems are designed to conduct a SIR evaluation of the data entered by the tank owner without assistance by a SIR data analyst. If a tank owner purchases and operates a stand alone SIR system, the following conditions apply:

1. The owner must complete a SIR agreement and agree to the terms and conditions contained herein as indicated by signing the statement appearing on page 6 of this document. This agreement must be submitted to the Division Director along with a list of locations where this method is being used. It is expected that tank owners using a “stand alone” SIR system will only use it on tanks that **they own**.
  2. If the owner/operator uses a stand alone SIR method **on tanks which they do not own, they will be assuming the full obligations of a SIR vendor as outlined in this agreement and are fully expected to meet all responsibilities incumbent on SIR vendors outlined herein.**
  3. All purchasers of stand-alone SIR software systems are required to maintain documentation as required in 1200-1-15-.04 (5) (a) which states: “All written performance claims pertaining to any release detection system used, and the manner in which these claims have been justified or tested by the manufacturer or installer, must be maintained for five (5) years from the date of installation”, meaning the beginning of the SIR system’s use by the purchaser.
  4. A stand alone SIR owner/operator must also retain a copy of the third party evaluation for the SIR method being used.
  5. Users of stand alone SIR systems may not make modifications to the software or in any way alter the method used to make leak detection determinations. The users may only operate the system as designed and are precluded from doing anything that will alter the sensitivity of the method or affect the probability of detection of probability of false alarm. Any modifications or software upgrades must be done by the SIR method developer or owner or owners authorized representative.
- D. A monthly report which consists of the inventory record used (raw data) plus the resulting SIR determination must be maintained by the owner/operator. All SIR results must be maintained and be made available to the Division during an inspection. The owner/operator must receive the SIR analysis no later than 10 business days after the end of the reporting period. The owner/operator must retain the last twelve months of leak detection results and, if applicable, the most recent line and/or tank tightness test results. If the results are anything other than “Pass” they must be reported.
- E. Tank owners are required to report the following conditions to the Division within 72 hours:
1. Any SIR result which is a “Fail” or,
  2. Any **second consecutive month** in which a tank received an “Inconclusive” SIR result.

**Failure to report a suspected release to the Division may result in enforcement action against the tank owner/operator.**

### **III. LIMITATIONS AND/OR EXCLUSIONS**

There are several items that must be considered before utilizing SIR as a release detection method. Please note the following:

- A. SIR may be used on manifolded UST systems in Tennessee without further evaluation as long as the total capacity of the manifolded system does not exceed the capacity for which the method was approved. If the capacity of the manifolded system exceeds this size, SIR may be used as inventory control, but must be supplemented with additional monitoring methods to meet leak detection requirements. If the Vendor has been evaluated with manifold data on a third party evaluation and listed on the List published by the National Work Group on Leak Detection Evaluations as having used the SIR Protocol addendum for manifold tanks, then the size limitations appearing on the List will apply for single and manifolded tanks.

- B. The size limitation for single tanks will be the size listed in the SIR evaluation on the List published by the National Work Group on Leak Detection Evaluations.
- C. The State of Tennessee does not recognize SIR analyses as a substitute for a tightness test.
- D. SIR is a test of that portion of the UST system that routinely contains product including the piping. SIR is not intended as a substitute for all required conditions for piping. All pressurized piping must also have mechanical or electronic line leak detectors in accordance with Rule 1200-1-15-.04 (4) (a).
- E. If the SIR vendor requires 90 days of data for initial evaluation, another method of monthly release detection must be conducted during that period.

Company Name (Please Type)\_\_\_\_\_ Date\_\_\_\_\_

Company Representative (Signature)\_\_\_\_\_

Official Title of Representative (Type)\_\_\_\_\_

**LANGUAGE THAT PURCHASERS OF STAND ALONE SIR SYSTEMS MUST INCLUDE:**

The Company assures that this agreement will be adhered to by any such licensees or franchisees of its SIR/SIA methodology operating in Tennessee and such agreement will be acknowledged by countersignature of the licensee or franchisee on the agreement,

Company Name (Please Type)\_\_\_\_\_ Date\_\_\_\_\_

Company Representative (Signature)\_\_\_\_\_

Official Title of Representative (Type)\_\_\_\_\_

(Franchisees/Licensees and purchasers must agree to the conditions stated below)

I (we)\_\_\_\_\_ representing\_\_\_\_\_

have purchased a SIR methodology known as \_\_\_\_\_ for use as leak detection compliance for petroleum underground storage tanks in Tennessee. I certify that I, or another appropriate company representative, have received adequate and proper instruction and training in the use of SIR methodology and understand its use and application to my tank system(s). I agree to operate this SIR program in accordance with all manufacturer's instructions, and abide by all conditions contained in item I. of the Agreement. I agree not to alter, adjust, or modify the software that will in any way affect it's ability to determine leaks at the stated precision levels determined in the Third Party evaluation. I understand that I will be considered to be "the Company" or "SIR vendor" where that term appears in this document. I further understand that if I provide SIR results for tanks that I (we) do not own, I may expose myself to some liability from the tank owner if I do not follow the requirements that I am agreeing to in this document. Listed below (or attached) is a list of all facilities where I (we) will be using SIR for leak detection compliance.

Company Name (Please Type)\_\_\_\_\_ Date\_\_\_\_\_

Company Representative Signature\_\_\_\_\_

Official Title (Type)\_\_\_\_\_

Facility UST ID Number

Facility Name

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